REMARKS

Discussion of Amendments

The specification has been amended at paragraph [0059], page 24, to describe that the non-luminescent colorant can be titanium dioxide, a triarylmethane dye, or a xanthene dye. This amendment is supported by original claims 136 and 139. The specification also has been amended at paragraph [0091] to correct an obvious spelling error.

Claim 1 has been amended to recite that the solvent is a volatile organic solvent and to recite that one or more acid species are generated. The amended claim is supported by paragraphs [0033] and [0064]. Claim 2 has been amended to recite that the species generated is an acid species. Claims 1-2 also have been amended to recite that the ink composition is an ink jet ink composition in the portion of the claim following "comprising". Claims 7, 8, 11, 15, 18-22, 78, 79, and 82 have been amended to describe the species generated as acid species. Claims 12, 18, 19, and 137 have been amended to recite that the ink composition includes one or more non-luminescent colorants. Claim 25, 28, 31, 35, 48, and 49 have been amended to depend upon claim 1. Claims 60, 62, and 64 have been amended to depend upon claim 2. Claims 88, 91, 93, and 95 have been made to depend upon claim 76. Claims 102 and 103 have been amended to depend upon claim 99. Claim 134 has been amended to recite that the ink composition includes one or more non-luminescent colorants and to recite that the species generated are acid species. Claims 144 and 145 have been amended to recite energy active "compound", consistent with the language of the independent claims. Claim 146 has been amended to recite that the solvent is volatile organic solvent and to recite that the non-luminescent colorant is present in an amount of 0.01 to about 10%. Claim 148 has been made to depend upon claim 146, and to recite that the organic solvent is volatile organic solvent.

No new matter has been added.

Restriction Requirement

Reconsideration is respectfully requested. The Office has withdrawn claims 4, 114-116, 119, and 121 as directed to a non-elected invention. Claim 4 is dependent upon claim 2. If claim 2, which is generic, is found allowable, then claim 4, directed to a non-elected species, should be considered in this application. Further, claims 114-116 are process (of

using) claims and include the limitations of claims 1 and 2. If product claims 1 and 2 are found allowable, then under the rejoinder provision, MPEP 821.04, the process claims should be rejoined. In the interest of concise prosecution, applicants respectfully request consideration of claims 119 and 121 also.

The Office Action

The Office Action sets forth the following grounds for rejection:

1. The specification is objected to for an alleged failure to provide proper antecedent basis for the claimed subject matter;

2. Claim 123 is objected to for an alleged informality;

3. Claims 12-14, 18-22, 134, 137-143, and 157 are rejected under 35 USC §112, second paragraph, as allegedly indefinite;

4. Claims 1, 5, 12, 13, 23, 24, 39, 40, 41, 46-48, 50, 51, 76, 77, 83, 84, 99-102, 104, 127, and 135-139 are rejected under 35 USC § 102(b), as allegedly anticipated by USP 5,296,275;

5. Claim 1-3, 5-7, 15, 16, 23, 24, 39, 40, 41, 43, 44, 50-53, 68, 73-75, 104, 105, 122, 127, and 128 are rejected under 35 U.S.C. § 102(b), as allegedly anticipated by USP 5,028,792;

6. Claims 1-3, 5-11, 15-17, 22, 39-41, 43, 44, 46-51, 68-75, 99-113, 117, 118, 146, 147, 149, 153, and 155 are rejected under 35 USC §102(b), as allegedly anticipated by USP 5,702,511;

7. Claims 1, 25-38, 85-98, 140-143, 146, 147, and 151-154 are rejected under 35 USC § 103(a), as allegedly unpatentable over the '275 patent;

8. Claims 1, 2, 25-38, 52-67, 123-133, 146, 150, 153, and 154 are rejected under 35 USC § 103(a), as allegedly unpatentable over the '792 patent; and

9. Claims 1-3, 103, 123-133, 148, 150, and 156 are rejected under 35 USC § 103(a), as allegedly unpatentable over the '511 patent.

Claims 42, 45, 78-82, 103, 120, 144, and 145 are objected to as being dependent upon a rejected base claim. The Office Action indicates that these claims would be allowable if re-written in independent form including all of the limitations of the base claim and any intervening claims. Applicants note that claim 120 is an independent claim. Accordingly, the objection to claim 120 is erroneous.

Discussion of Rejections

1. Objection to Specification

The Office Action alleges that there is no clear teaching in the specification that the species act to decrease the intensity of the emission from the luminescent compound. Applicants respectfully disagree. At paragraph [0019], the specification teaches that the energy active compound alters the characteristic of the colorant and/or the luminescent compound. The specification further explains that one or more species react to alter the characteristic of the luminescent colorant and/or the non-luminescent colorant. See line 3, paragraph [0019]. In lines 6-7, paragraph [0019] teaches that the reaction can alter the intensity of the emission. In lines 9-10, paragraph [0019] teaches that the intensity of emission may be increased or decreased. In view of the foregoing, this objection to the specification is erroneous and should be withdrawn.

The Office Action further alleges that there is no clear teaching in the specification that the onium salt can be iodonium salts or sulfonium salts each having at least one aryl group. Paragraph [0039] teaches that the onium salt is selected from the group consisting of diazonium salts, iodonium salts having at least one aryl group, sulfonium salts having at least one aryl group and the any combination thereof. In view of the foregoing, this objection is erroneous and should be withdrawn.

The Office Action further alleges that there is no clear teaching in the specification that the non-luminescent colorant can be titanium dioxide, any triarylmethane dye or any xanthene dye. Applicants have amended paragraph [0059] of the specification. The amendment renders the objection moot.

In view of the foregoing, the objection to the specification should be removed.

2. Claim 123

The spelling error in anthracene has been corrected. In view of the foregoing, the objection to claim 123 should be withdrawn.

3. Indefiniteness Rejection

Claims 12, 18, 19, 134, and 137 have been amended to recite that the ink composition includes one or more non-luminescent colorants. Claims 13 and 14 are dependent upon claim 12. Claims 20-22 and 157 are dependent upon claim 19. Claims 138-143 are dependent upon claim 137. In view of the foregoing, the indefiniteness rejection should be withdrawn.

4. Anticipation Rejections

(a) Claims 1, 5, 12, 13, 23, 24, 39, 40, 41, 46-48, 50, 51, 76, 77, 83, 84, 99-102, 104, 127, and 135-139:

To anticipate a claim, in terms of 35 U.S.C. § 102, every element of the claimed invention must be identically shown in a single reference. *Diversitech Corp. v. Century Steps, Inc.*, 850 F.2d 675, 677, 7 USPQ2d 1315, 1317 (Fed. Cir. 1988). The '275 patent fails to disclose each and every element of the claimed invention. Particularly, the '275 patent fails to disclose the use of a volatile organic solvent. Volatile organic solvents are defined at paragraph [0064] as those that exhibit an evaporation rate of at least a factor of 0.2 times that of n-butyl acetate (whose evaporation rate is 1.0). The '275 patent discloses a water based ink composition, not an ink based on volatile organic solvent. See, for example, column 3, lines 10 and 23-24, column 4, line 48, column 5, lines 5, 20, 37, and 55. At column 3, lines 31-38, the '275 patent discloses "flow aids". These are glycols (diethylene glycol), gum esters, and ester alcohols such as pentane diol esters (Texanol from Kodak Co.). Diethylene glycol has an evaporation rate of <0.0011 (see page 6 of attached MSDS for diethylene glycol); Texanol (2,2,4-trimethyl-1,3-pentanediol monoisobutyrate) has an evaporation rate of 0.002 (see page 1 of attached Properties of Texanol - Eastman). These are not volatile organic solvents since they have an evaporation rate less than 0.2 times that of n-butyl acetate (1.0).

Those of skill in the art would know that gum esters are a class of chemicals resulting from the chemical modification of gum rosins. The gum esters are either solids or viscous liquids, and in either case, they are not volatile organic solvents. See, for example, glycerol esters of rosin having a softening point of from 85 °C to 128 °C and pentaerythritol esters having a softening point of from 97 °C to 178 °C (see attached Product Listing from Eastman). Thus, gum esters are not volatile organic solvents.

In view of the foregoing, the '275 patent fails to disclose the presently claimed invention. Accordingly, the anticipation rejection should be withdrawn.

(b) Claims 1, 2, 25-38, 52-67, 123-133, 146, 150, 153, and 154:

The '792 patent fails to disclose the presently claimed invention. Independent claims 1 and 2 have been amended, as discussed, to recite that the ink composition is an ink jet ink composition. The '792 fails to disclose and ink jet ink composition. The '792 patent is directed to a film that comprises a mixture of hydrophilic polymer, a nitro-substituted aromatic aldehyde for producing hydrogen ions in response to UV radiation and at least one dye that is substantially insensitive to changes in temperature and sensitive to changes in hydrogen ion concentration. It is disclosed that the film can optionally contain water (column 4, lines 37-38). The '792 patent discloses that the films of the invention comprise a mixture of from *about 50 to about 99 weight percent polyvinyl alcohol*, from about 0.5 to about 50 weight percent water, from about 0.01 to about 5 weight percent of at least one acid-sensitive dye that is substantially insensitive to changes in temperature, from about 0.05 to about 5 weight percent of a surfactant; and from about 1 to about 40 weight percent nitro-substituted aromatic aldehyde (column 5, lines 40-53) (*Emphasis added*). Those of ordinary skill in the art would know that such a composition cannot be used in an ink jet printer, especially because of the very high percentage of dissolved solids such as polyvinyl alcohol, which would result in a high viscosity. Accordingly, the '792 patent fails to disclose the presently claimed invention. In view of the foregoing, the anticipation rejection over the '792 patent should be withdrawn.

(c) Claims 1-3, 103, 123-133, 148, 150, and 156:

The '511 patent fails to disclose the presently claimed invention. The '511 patent fails to disclose an energy active compound that generates an acid species. Neither the photochromic pigment nor the non-photochromic pigment constitutes an energy active compound that generates an acid species. Those of skill in the art know that the photochromes disclosed by the '511 patent, upon irradiation, do not form acid species. The photochromes are known to absorb light energy and undergo a reversible intramolecular rearrangements which are in most cases due to shifts in atomic electronic distributions and not the release of an acidic component. For example, among the photochromes disclosed at col. 3, lines 30-33, those of skill in the art would know that stilbene, indigo, and thio-indigo

undergo cis/trans isomerization upon irradiation; that spiropyrans and spirooxazines undergo pericyclic rearrangement; that fulgicides undergo photocyclization; that dithizonates undergo intramolecular hydrogen transfer; and that endoperoxides undergo redox elimination reaction. See, for example, page 651, depicting the transitions taking place upon irradiation on spiropyrans, spirooxazines, and fulgicides; page 654, section VI.2 for stilbenes and thioindigoids and section VI.3 for dithizonates; and page 658 for endoperoxide (HECDPO) of Bouvas-Laurent et al., *Pure Appl. Chem.*, *73*, 639-665 (2001) (copy attached). In view of the foregoing, the '511 patent fails to disclose the presently claimed invention. Accordingly, the anticipation rejection should be withdrawn.

5. Obviousness Rejections

(a) Claims 1, 25-38, 85-98, 140, 143, 146, 147, and 151-154:

These claims stand rejected as allegedly unpatentable over the '275 patent. Although applicants disagree with the rejection, applicants have amended the claims. The '275 patent fails to suggest the presently claimed invention. The Office would fail to make a *prima facie* case for obviousness of the amended claims.

To establish a *prima facie* case for obviousness, the Office must satisfy *three* requirements: (1) the prior art relied upon must contain some suggestion or incentive, coupled with knowledge generally available in the art at the time of the invention, that would have motivated those of ordinary skill in the art to modify a reference or combine the references. See, *Karsten Mfg. Corp. v. Cleveland Gulf Co.*, 242 F.3d 1376, 1385, 58 USPQ2d 1286, 1293 (Fed. Cir. 2001); (2) the proposed modification of the prior art must have had a reasonable expectation of success, determined from the vantage point of the skilled artisan at the time the invention was made. In other words, hindsight analysis is not allowed. See *Amgen, Inc. v. Chugai Pharm. Co.*, 927 F.2d 1200, 1209, 18 USPQ2d 1016, 1023 (Fed. Cir. 1991) ("While the idea of using a monkey gene to probe for a homologous human gene may have been obvious to try, many pitfalls existed that would have eliminated a reasonable expectation of successfully obtaining the EPO gene. Hindsight is not a justifiable basis on which to find that ultimate achievement of a long sought and difficult scientific goal was obvious."); and (3) the prior art reference or combination of references must teach or suggest all the limitations of the claims. See *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970) ("All

words in a claim must be considered in judging the patentability of that claim against the prior art.").

As discussed, the '275 patent discloses water-based ink compositions. Water does not suggest volatile organic solvents. Applicants respectfully submit that there is nothing in the '275 patent that would motivate those of ordinary skill in the art to employ a volatile organic solvent. There is nothing in the cited reference to motivate those of ordinary skill in the art to the desirability of using a volatile organic solvent. There is no incentive whatsoever for that modification.

Further, the '275 patent describes, e.g., at col. 1, lines 25-50, that the nonionic polymeric resin carrier base must be water-soluble; the non-ionic wetting agent must be water-compatible; the thickening agent must be water-compatible; and the flow-aid must be water-soluble. Further, the '275 patent indicates: "the wetting agent, thickening agent and flow-aid *all cooperate* with the dye to change color in response to a change in proton level". In addition, the '275 patent teaches that the photoacid or photobase progenitor, dye, wetting agent, thickening agent and flow-aid *all cooperate* to provide a photochromic ink which changes color upon exposure to ultraviolet radiation" (*Emphasis added*). The foregoing clearly shows that the invention described in the '275 patent works only when the ingredients are chosen as described (e.g., with focus on water-solubility and/or compatibility). There is no teaching in the '275 patent that any of the ingredients could be changed and the invention would still work. Those of ordinary skill in the art would read the disclosure of the '275 patent to require that the cooperation among the ingredients would be disrupted (loss of co-operation) if changes were made as to the type of ingredients, thereby defeating the operability of the invention. Motivation is lacking where the proposed modification would destroy the intended function of the reference. See *In re Fritch*, 972 F.2d 260, 1265 n.12, 23 USPQ2d 1780, 1783 n.12 (Fed. Cir. 1992) ("A proposed modification is inappropriate for an obviousness inquiry when the modification renders the prior art reference inoperable for its intended purpose.").

Furthermore, since changing the ingredients as described above would disrupt the cooperation which is required for the invention, there is no reasonable expectation of success for the proposed modification of replacing water with volatile organic solvent. *Both* the

suggestion *and* expectation of success must be founded in the prior art, not in applicants' disclosure. See, *In re Dow Chem. Co.*, 837 F.2d 469, 5 USPQ2d 1529 (Fed. Cir. 1988) (*Emphasis added*). Here, there is neither a suggestion nor a reasonable expectation of success.

In view of the foregoing, applicants respectfully submit that the present claims are patentable over the '275 patent.

(b) Claims 1, 2, 25-38, 52-67, 123-133, 146, 150, 153, and 154:

These claims stand rejected as allegedly unpatentable over the '792 patent. Although applicants disagree with the rejection, applicants have amended the claims. The '792 patent fails to suggest the presently claimed invention. The Office would fail to make a *prima facie* case for obviousness of the amended claims.

There is nothing in the '792 patent that would motivate those of ordinary skill in the art to prepare an ink jet ink composition. The invention of the '792 patent relates to actinometry, and is directed to a film that changes color in response to UV radiation. There is no teaching of an ink jet ink composition. The '792 patent describes that, to produce the film, the composition is simply applied (Examples 1, 5, 9, and 24), pipetted (Examples 2 and 14-18), spray painted (Example 3), sprayed (Example 4, col. 9, line 15; Example 21), poured or cast onto glass (Examples 6-8, 10, 11, and 27-31), applied with brush (Example 23), evaporated from a dish (Example 25), screen printed on PVA films (Example 33), or simply printed (Example 34). There is no suggestion for ink jet printing. There is no incentive or desirability in the '792 patent to employ ink jet printing.

Further, there is no reasonable expectation of success in modifying the '792 patent to arrive at the presently claimed invention. For example, the composition taught by the '792 patent contains large amounts of dissolved solids (about 50 to about 99% polyvinyl alcohol). Those of ordinary skill in the art know that such compositions would be too thick (or too viscous) to be suitable for printing in an ink jet printer.

In view of the foregoing, applicants respectfully submit that the present claims are patentable over the '792 patent.

(c) Claims 1-3, 103, 123-133, 148, 150, and 156:

These claims stand rejected as allegedly unpatentable over the '511 patent. Although applicants disagree with the rejection, applicants have amended the claims. The '511 patent fails to suggest the presently claimed invention. The Office would fail to make a *prima facie* case for obviousness of the amended claims.

As discussed, the '511 patent fails to disclose an ink jet ink composition containing an energy active compound that, upon exposure to energy, generates an acid species. One of the elements of the claimed invention is missing from the cited reference. The photochromic pigment or dye disclosed by the '511 patent does not suggest to those of ordinary skill in the art the energy active compounds that generates an acid species when exposed to energy. As discussed, the photochromes disclosed by the '511 patent operate by entirely different mechanism(s). In view of the foregoing, the presently claimed invention is not obvious over the '511 patent.

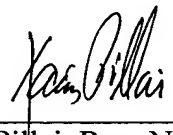
Further, the presently claimed invention provides an unexpected and superior property. As set forth in the specification, for example, Examples 1-3, the percent remaining luminescence after exposure to UV lamp is much less when a energy active compound that generates an acid species (UVI-6976 or CGI-552) was used than when no energy active compound is used. Thus, Example 1 samples produced from solutions 2 and 3 (with energy active compound) had 4 and 1% remaining luminescent after exposure compared to 86% remaining luminescence for solution 1 (without an energy active compound). See also Example 2 samples produced from solutions 11 and 13, where the remaining luminescence is 2% or 1%, when DBCH (1,2-dibromocyclohexane) or TBE (tribromoethanol) is used as the energy active compound, respectively; and Example 3 samples produced from solutions 17-20, where the remaining luminescence is 8%, 18%, 6%, or 1%, when PYR-100 (1,2,3-[trismethanesulfonate]benzene), DAM-301 (diazomethane compound), SI-105 (succinimidyl sulfonate ester), or CGI-263 (sulfonated nitride) is used as the energy active compound, respectively.

In view of the foregoing, applicants respectfully submit that the present claims are patentable over the '511 patent.

Conclusion

A favorable decision is solicited. If, in the opinion of the Examiner, a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned attorney.

Respectfully submitted,



Xavier Pillai, Reg. No. 39,799
LEYDIG, VOIT & MAYER, LTD.
Two Prudential Plaza, Suite 4900
180 North Stetson Avenue
Chicago, Illinois 60601-6780
(312) 616-5600 (telephone)
(312) 616-5700 (facsimile)

Date: October 26, 2005

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